

REMARKS

Claims 1-18, 20-24 and 26-30 are currently pending in the subject application and are presently under consideration. Claims 1-12, 20, 21 and 26 have been amended as shown on pages 2-5 of the Reply.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claims 1, 12, 21 and 26 Under 35 U.S.C. §101

Claims 1, 12, 21 and 26 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Withdrawal of this rejection is respectfully requested for at least the following reasons. Claims 1, 12, 21 and 26 as amended recite computer implemented systems and methods that are utilized in management of locks on database resources. The claims pertain to a computer executable lock manager that stores a reference count of child locks within a parent lock so that the parent lock is released upon releasing all the child locks. Such a system produces a concrete, tangible result of a reference count of child locks stored within parent locks which is useful for determining the lifetime of the parent locks. Accordingly, it is submitted that the computer implemented system and method recited in the subject claims produces a useful, concrete and tangible result and is therefore statutory.

II. Rejection of Claims 1, 5-21 and 25 Under 35 U.S.C. §102(b)

Claims 1, 5-21 and 25 stand rejected under 35 U.S.C. §102(b) as being anticipated by Chan *et al.* (US 6,108,654). Withdrawal of this rejection is requested for at least the following reasons. Chan *et al* does not disclose or suggest all the features of the subject claims.

A single prior art reference anticipates a patent claim only if it *expressly or inherently describes each and every limitation* set forth in the patent claim. *Trintec Industries, Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 63 USPQ2d 1597 (Fed. Cir. 2002); *See Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). *The identical invention must be shown in as complete detail as is contained in the ... claim.* *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Applicants' claimed invention relates to systems and methods for supplying a database with a parent-child lock hierarchy arrangement, such that each lock contains sufficient information to determine its own lifetime. In particular, independent claim 1 recites *a computer implemented database management system comprising a lock manager that acquires a parent lock and one or more child locks on resource(s) of a database, the lock manager stores a reference count of the one or more child locks within the parent lock such that the parent lock is released upon release of all child locks associated therewith*. Independent claims 12, 20 and 21 recite similar features. Chan *et al.* does not disclose or suggest such novel features of applicants' claimed subject matter.

Chan *et al.* relates to finer-grained dynamic allocation and de-allocation of locks in a system, while protecting against abnormal termination that may result in data integrity problems. At page 6 of the Office Action, the Examiner contends that Chan *et al.* teaches such novel features of applicants' claimed invention. Applicants' representative avers to the contrary. In accordance with the subject invention, a multi-level hierarchy tree with a plurality of parent locks, each of which is associated with one or more child locks is employed by a lock manager to acquire locks on resources in a database. A reference count of the locks is employed by the system, wherein as each lock is being released, a number of locks referenced by an associated parent lock of the released lock can be decremented by one, and upon release of all child locks associated with a parent lock, the parent lock can also subsequently be released. At the cited portions, Chan *et al.* discloses a distributed data processing system comprising multiple nodes, each node comprising a data store and a data processing system with objects or resources shared with any of the other nodes. (See. Col 4, lines 3-9). Thus, the nodes disclosed by Chan *et al.* are nodes in a distributed data processing system but nowhere does Chan *et al.* disclose a parent/child or a root/leaf relationships between the nodes as contended in section 5 page 2 of the subject Final Office Action. Chan *et al.* also discloses each node having its own instantiation of a distributed lock manager, the locks allocated for processes in each node and managed by the lock manager of that node. However, Chan *et al.* is silent regarding *a lock manager that acquires a parent lock and one or more child locks on resource(s) of a database*. Further, at the cited portions, Chan *et al.* teaches recovery domains wherein each lock manager instance on a distributed node maintains recovery domain objects including *a reference count of local processes* currently attached to the recovery domain (See Chan *et al.* col. 12 lines 34-36). Hence,

the reference count in accordance with Chan *et al.* is the number of local processes in a recovery domain rather than number of locks maintained in parent lock as recited in the subject claims. Thus, Chan *et al.* is silent regarding maintaining **a reference count of the one or more child locks within the parent lock such that the parent lock is released upon release of all child locks associated therewith** as recited by applicants' claimed subject matter.

In view of the above, it is readily apparent that Chan *et al.* does not teach or suggest all limitations as recited in independent claims 1, 12, 20 and 21 (and the claims that depend from). Accordingly, it is respectfully requested that this rejection should be withdrawn.

III. Rejection of Claims 2-4, 22-24 and 26-30 Under 35 U.S.C. §103(a)

Claims 2-4, 22-24 and 26-30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Chan in view of Detlefs, *et al.* (Non Patent Literature "Lock-free reference counting"). Withdrawal of this rejection is requested for at least the following reasons. Chan *et al.* or Detlefs alone or in combination fail to teach or suggest each and every limitation of applicants' claimed invention.

To reject claims in an application under §103, an examiner must establish a *prima facie* case of obviousness. A *prima facie* case of obviousness is established by a showing of three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicants' disclosure. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The subject claims depend from independent claims 1, 21 and 26. As discussed *supra*, Chan *et al.* does not teach or suggest each and every element of the subject invention as recited by independent claims 1 and 21. Detlefs *et al.* fails to make up for the aforementioned deficiencies of Chan *et al.* Detlefs *et al.* relates to designing data structure implementations and the use of garbage collection to simplify the design of sequential implementation of data structures. Detlefs *et al.* fails to teach or suggest **a lock manager that acquires a parent lock**

and one or more child locks on resource(s) of a database. Therefore, it is respectfully submitted that Chan *et al.*, and Detlefs *et al.*, alone or in combination, do not teach or suggest applicants' invention as recited in independent claims 1 and 21 (and claims 2, 4, 22, 23 and 24 that depend from).

Independent claim 26 recites *a computer executable lock manager that acquires at least a parent lock and one or more child locks on a database resource, the lock manager creates within the parent lock a reference count of the child lock so that the lock manager releases the parent lock upon the reference count attainment of a zero value.* Chan *et al.*, and Detlefs *et al.* alone or in combination fail to teach or suggest each and every limitation of applicants' claimed subject matter. Chan *et al.* relates to finer-grained dynamic allocation and de-allocation of locks in a system, while protecting against abnormal termination that may result in data integrity problems. As discussed supra, Chan *et al.* is silent regarding a lock manager that acquires a parent lock and a child lock on a resource of a database, and so does not teach a computer executable lock manager that acquires at least a parent lock and one or more child locks on a database resource as recited by independent claim 26 of applicants' subject claims. Detlefs *et al.* does not compensate for the aforementioned deficiencies of Chan *et al.* Detlefs *et al.* is silent regarding parent locks and child locks, let alone a lock manager as recited by independent claim 26 of applicants' claimed subject matter.

Therefore, it is respectfully submitted that Chan *et al.* and Detlefs *et al.*, alone or in combination, do not teach or suggest applicants' invention as recited in independent claims 1, 21 and 26 (and the claims that depend from). Accordingly, withdrawal of this rejection is respectfully requested.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [MSFTP622US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

AMIN, TUROC & CALVIN, LLP

/Himanshu S. Amin/

Himanshu S. Amin

Reg. No. 40,894

AMIN, TUROC & CALVIN, LLP
24TH Floor, National City Center
1900 E. 9TH Street
Cleveland, Ohio 44114
Telephone (216) 696-8730
Facsimile (216) 696-8731